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2013-2015 NUCLEAR BUSINESS PLAN

May 16, 2013

Wayne Robbins, Chief Nuclear Officer

ONTARIO POWER GENERATION

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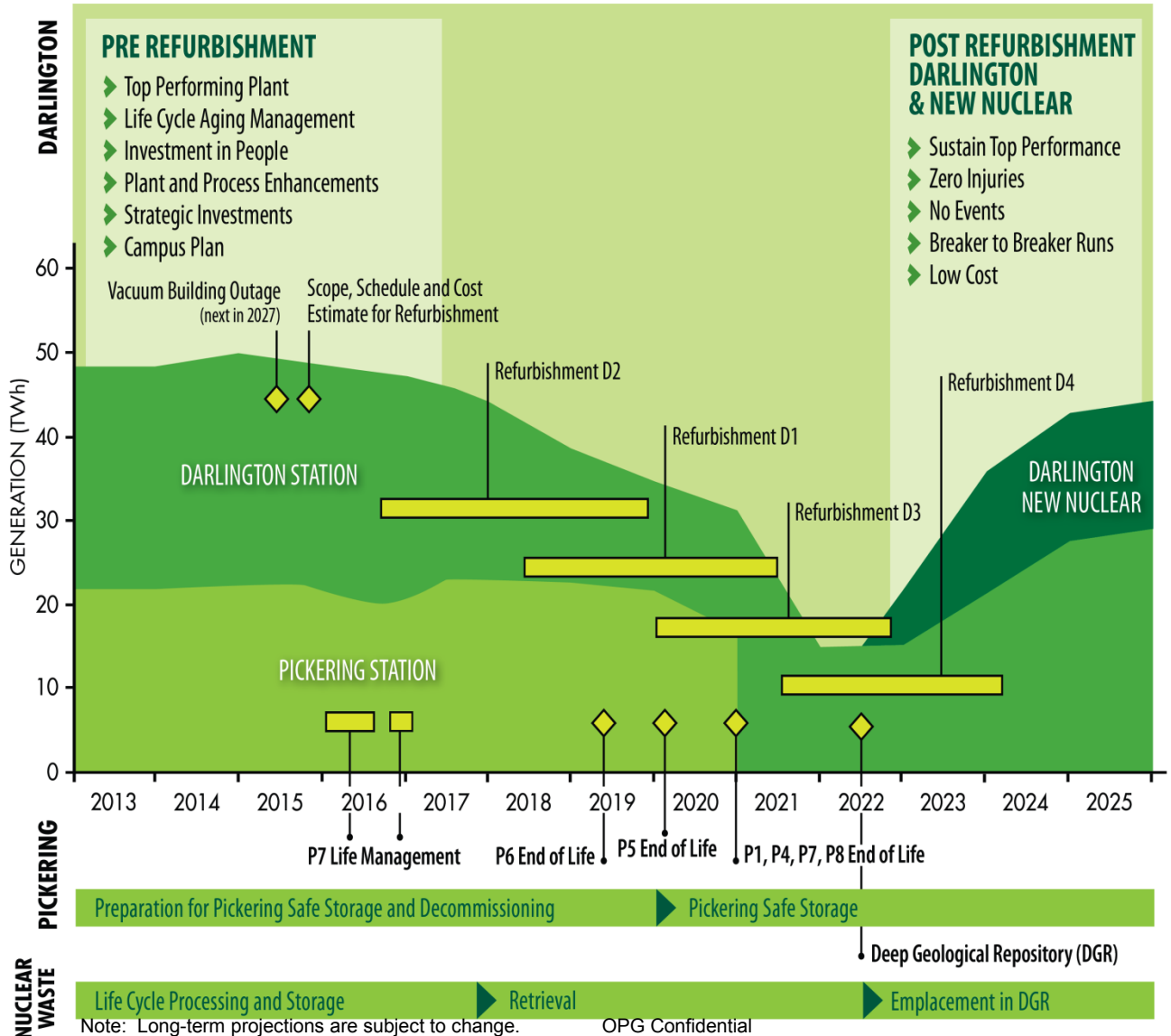
Nuclear Strategic Framework

PEOPLE POWERING THE FUTURE
OPG NUCLEAR

Nuclear Cornerstones for Excellence

• Safety • Reliability • Value for Money • Human Performance



Note: Long-term projections are subject to change.

2013

STRATEGIC OBJECTIVE

Operate in a safe, efficient and cost effective manner, with prudent investments to improve reliability and lower production costs.

STRATEGIC INITIATIVES

- Initiatives that close gaps to industry top performance.
- Darlington Top Performance.
- Pickering Ready and Reliable by 2015.
- Improve fleet outage performance.
- Continue to be industry leaders in Nuclear project management.
- Implement Engineering / Procurement / Construction strategy.

BEHAVIOURS

- Integrate and Collaborate.
- Think Top and Bottom Line.
- Simplify It.
- Say It. Do It.
- Tell It As It Is.

ONTARIO POWER GENERATION

Nuclear Operations - Executive Summary

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The 2013-2015 OPG Nuclear Operations Business Plan is the first plan to reflect the Corporate Business Transformation (BT) initiative (Phase I). Its immediate objective is to ensure the safe and successful implementation of the 2012-2014 Business Plan, while moving towards the BT end state. Plan highlights include:

- Sustaining high performance levels in Safety and Human Performance through improvement opportunities and continued emphasis on supervisory effectiveness and development programs.
- Extending the operating life of Pickering units to 247k Equivalent Full Power Hours (EFPH).
- Slight reduction in generation plan from the previous plan largely due to additional outage and inspection scope required to extend Pickering's operating life to 247k EFPH. Generation plan includes advancing outage scope from Darlington planned outage in 2017 to 2014 (and 2015). Pickering generation plan optimized through selective reduction in feeder replacement outage scope.
- Improving the reliability of critical equipment at Pickering station, leading to a Forced Loss Rate of 5.5% in 2015, which represents a step change in performance.
- Maintaining top quartile performance at Darlington which supported the excellent safety and performance evaluation from the World Association of Nuclear Operators.
- Continue preparations at Darlington for the start of Refurbishment in October 2016 and for the Vacuum Building Outage in 2015.
- Staffing plan reductions, through detailed attrition modeling and changes to the workforce development program, and meeting objectives by simplifying and integrating processes.
- As a result of this plan, OPG Nuclear will support Business Transformation over the planning period, leading to a more sustainable cost structure, and continue to deliver on its mission of proudly generating clean, safe, low cost electricity through dependable performance.

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Nuclear Operations - Planning Assumptions

Pickering

- Continued Operations will extend the operating life of Pickering units to 247k EFPH. Unit 6 will operate to 2019 and Units 1, 4, 5, 7 and 8 will operate to 2020.

Darlington

- Refurbishment begins with Unit 2 in October 2016 and ends in February 2024. Refurbishment outages are 36 months each for Units 2, 1, 3, and 4, with a 16 - 19 month overlap between units. Darlington continues driving towards top industry performance post-refurbishment.
- There is a Vacuum Building Outage (VBO) in 2015, eliminating the need for a VBO in 2021 during the refurbishment window. The frequency of VBOs and Station Containment Outages will be changed to once every 12 years (CNSC approval still required).
- Work originally planned for the D1711 outage will be advanced to 2014-2015 to minimize 2017 outage duration.

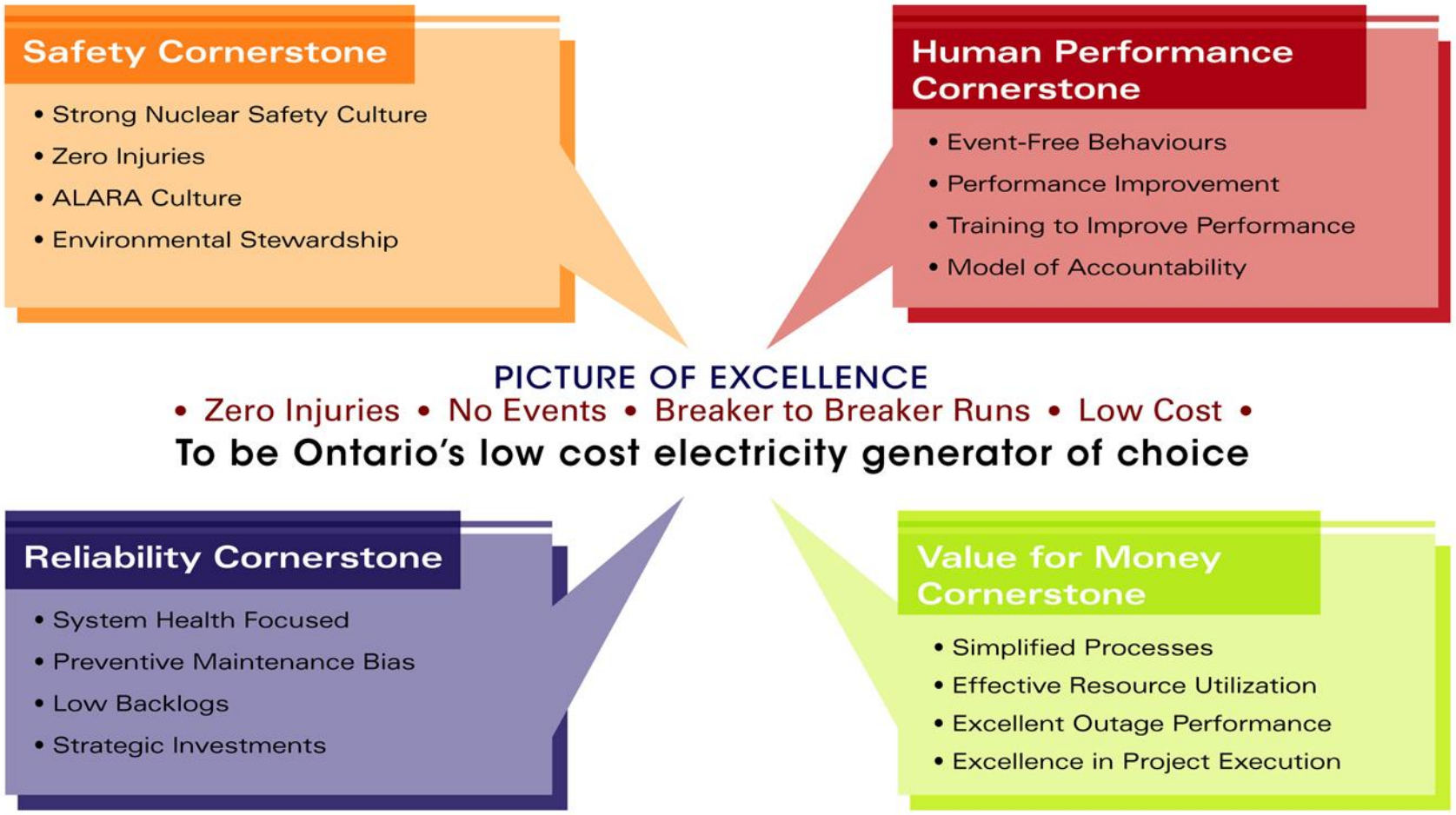
Nuclear Waste Management

- Increased production targets of Dry Storage Containers (DSCs) at the Darlington and Pickering Waste Management Facilities will be maintained with no additional staff increases.
- The Low and Intermediate Level Waste Deep Geological Repository (DGR) is delayed by 3 years.

Nuclear Support

- Improvements and organizational changes will be made to fully implement Business Transformation Initiatives and business efficiencies from the centre-led model over the next 3 years.
- Project portfolio investments align with end of life and refurbishment assumptions at both sites.
- CNSC licenses will transition to 10-year terms during 2013-2015 (Darlington and Darlington Waste Management Facility).
- Workforce development is focused primarily on Operator development to meet Nuclear demands to ensure an adequate number of fully qualified operators.

Nuclear Cornerstones



Nuclear Operations - Issues and Focus Areas

Fleet

- Continue improving work protection practices.
- Enforce accountability and leadership delegation. ("Say it. Do it.")
- Improve outage preparation and performance execution.
- Improve chemistry performance of the operating reactors (2013-NFI-03).
- Corrective Maintenance backlog reduction (2013-NFI-04).
- Develop strong relationships with the centre-led functions.

Pickering

- Continue to reduce Collective Radiation Exposure (2013-NFI-01).
- Continue to improve Forced Loss Rate (2013-NFI-02).
- Execute the Reliability Improvement Plan and achieve a step change in performance (5.5% FLR) by 2015.
- Execute Continued Operations work programs. Focus on Minor Modification improvements and design legacy issues.
- Renew the station operating license as one site in 2013.

Darlington

- Integrate and align with the Refurbishment Project, resulting in approved scope, strategic investments and staffing.
- Implement mitigation activities to prevent derating from Heat Transport System aging.
- Increase licensed staff training throughput to maintain target levels for authorized staff.

Nuclear Waste

- Process and store annual commitment of Dry Storage Containers and Low Level Waste in alignment with station generation targets. Execute waste strategy with a focus on reducing Low and Intermediate Level radioactive waste and the environmental footprint.
- Investigate and, where feasible, execute Used Fuel long-term potential cost reduction initiatives.
- Maintain Safety and Environment Certifications, and improve Fire Protection Program and Systems.

Nuclear Support

- Nuclear Engineering – Implement an effective centre-led Engineering management structure and accountability.
- Nuclear Services – Provide effective and efficient Radiation Protection Services, Regulatory Affairs, Strategic Planning and Benchmarking, Environmental Assessments and Stakeholder Relations through centre-led functions.
- Operations and Maintenance Support – Enable improved fleet performance through: leadership, direction setting and performance monitoring, process improvement, collaboration, and partnership.
- Security and Emergency Services – Ensure OPG is prepared for, can respond to, and recover from emergencies.

Nuclear Operations - Generation Plan

	2013	2014	2015
Pickering Nuclear			
Net Generation in TWh	21.1	21.3	21.9
Planned Outage Days	304	293	288
Forced Loss Rate %	8.1	7.8	5.5
Unit Capability Factor %	79.2	79.9	82.1
Darlington Nuclear			
Net Generation in TWh	26.9	28.4	26.1
Planned Outage Days	144	77	188
Forced Loss Rate %	1.5	1.3	1.0
Unit Capability Factor %	88.8	93.5	86.3
OPG Nuclear			
Net Generation in TWh	48.0	49.7	48.0
Planned Outage Days	448	370	476
Forced Loss Rate %	4.5	4.1	3.1
Unit Capability Factor %	84.3	87.2	84.3

Highlights

- The Generation Plan maintains Nuclear's planned production level in 2013 from the previous plan. In 2014 planned production level decreases by 0.1 TWh, from the previous plan, due to additional inspection and outage work required to extend Pickering's operating life to 247k EFPH.
- Reliability of critical equipment at Pickering station will be improved, resulting in a step change in performance by 2015 (i.e., FLR target of 5.5%).
- Pickering's Net Generation in TWh reflects additional planned outage days for Continued Operations. The impact on 2013 and 2014 is -0.7 TWh in each year.
- There are two Darlington planned outages in 2013.
- A significant portion of the planned D1711 outage work has been advanced to 2014 and 2015 to minimize 2017 outage duration during Darlington Refurbishment.

Nuclear Operations – 3 Year Performance Targets

2011

Metric	2011 Actuals (Rolling Average) Pickering	Darlington	2015 Target Guidelines (Annual) Pickering	Darlington
Safety				
All Injury Rate (#/200k hours worked)	0.31	0.18	0.89	0.89
Industrial Safety Accident Rate (#/200k hours worked)	0.04	0.09	0.15	0.15
Collective Radiation Exposure (Person-rem per unit)	110.07 ⇧	71.12	98.71	73.80
Airborne Tritium Emissions (Curies) per Unit	2,565	969	1,800	1,000
Fuel Reliability Index (microcuries per gram)	0.000175 ⇧	0.001133 ⇩	0.000500	0.000500
Reactor Trip Rate (# per 7,000 hours)	0.60 ⇩	0.21	0.50	0.50
Auxiliary Feedwater System Unavailability (#)	0.0044	0.0000	0.0200	0.0200
Emergency AC Power Unavailability (#)	0.0107	0.0067	0.0250	0.0250
High Pressure Safety Injection Unavailability (#)	0.0001	0.0000	0.0200	0.0200
Reliability				
WANO NPI (Index)	66.1	92.8	74.2	96.1
Forced Loss Rate (%)	10.34	1.80	5.50	1.00
Unit Capability Factor (%)	72.5	89.6	82.1	86.3
Chemistry Performance Indicator (Index)	1.10	1.03	1.04	1.01
On-line Deficient Maintenance Backlog (work orders per unit)	301	266	< 197	180
On-line Corrective Maintenance Backlog (work orders per unit)	160	121	78	25
Value for Money				
Total Generating Cost per MWh ($ per Net MWh)[1]	65.86	33.05 ⇧	60.25	42.78
Non-Fuel Operating Cost per MWh ($ per Net MWh)[1]	56.54	26.42	53.34	32.82
Fuel Cost per MWh ($ per Net MWh)[1]	4.27	4.24	5.93	5.28
Capital Cost per MW DER (k$ per MW)[1, 2]	32.54	18.54	6.98	34.82
Human Performance				
Human Performance Error Rate (# per 10k ISAR hours)	0.007 ⇧	0.006 ⇩	0.004	0.004

2015

- Continue to lead industry in overall conventional and nuclear safety performance, with top quartile performance from both stations. Plan in place at Darlington to address fuel defects.
- Focus on work order readiness, reducing backlogs, improving maintenance effectiveness, and work management to improve reliability of the units. Execute the approved Nuclear Fleet Initiatives.
- Pickering continue to benefit from organizational efficiencies through Pickering site amalgamation and implementation of value for money initiatives. Continue focusing on value for money and outage cost reductions at Darlington.
- Darlington's 2015 TGC/MWh and NFOC/MWh are higher as a result of the planned VBO/SCO.
- Minimize the number of event free day resets through improved use of event free tools, oversight, and dynamic learning activities.

[1]TGC/MWh and NFOC/MWh targets exclude OPEB, Pension, and Corporate Asset Service Fees to align with industry standards.
[2]DER - Design Electrical Rating.

⇩ Declining Benchmark Quartile Performance vs. 2010
⇧ Improving Benchmark Quartile Performance vs. 2010

Green = max NPI points achieved (if applicable) or best quartile performance
White = 2nd quartile performance
Yellow = 3rd quartile performance
Red = worst quartile performance

Pickering - Executive Summary

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The vision for Pickering Nuclear is to be *"Ready and Reliable by 2015"* to ensure that the station delivers the needed power as Darlington units are taken offline for refurbishment.

The Approved Plan, including planned reliability improvements, is on track and is achieving the results as originally predicted.

This plan reflects a commitment to achieve further improvements relative to staffing, financial and operational targets.

- Revenues will be increased by improving equipment reliability and reducing the Forced Loss Rate (FLR) to 5.5% in 2015.
- Revenues will be further increased by extending the life of the station to 2020 through the successful completion of the Continued Operations work program.
- Costs will be reduced by improving productivity through implementation of station initiatives such as Days Based Maintenance and Work Management Restructuring.
- Favourable WANO evaluation results will be attained and the operating license will be renewed as one Site for the first time in 2013.
- High safety standards will be achieved by consolidating expertise and successfully qualifying staff, restoring plant conditions, and establishing controls on asbestos.

Key Operating Assumptions

- Each unit will be operated up to 247k Equivalent Full Power Hours.
- Unit 6 will operate to 2019. The remaining five units will operate to 2020.
- Improved equipment reliability, resulting in reduction in FLR to 5.5% in 2015.

Pickering - Major Focus Areas

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SAFETY

- Renew the operating license as one Site in 2013
- Restore plant condition
- Execute an effective asbestos abatement program
- Improve work protection performance
- Further reduce tritium emissions
- Minimize collective radiation exposure through improved work practices, ALARA mentoring, and improved Fuelling Machine filtration
- Implement Fukushima emergency response readiness

HUMAN PERFORMANCE

- Achieve favourable WANO evaluations
- Enhance authorized staff hiring and through-put to meet short and long term demands
- Implement Corrective Action Plan improvement including improving quality of root cause analyses
- Improve operator fundamentals, reduce operator challenges and improve plant status control
- Improve leadership, accountability, and supervisory effectiveness
- Implement the Maintenance Critical Work Quality Program

RELIABILITY

- Execute the Reliability Improvement Plan and achieve a step change in performance (5.5% FLR) by 2015
- Execute the Continued Operations work program
- Resolve recurring equipment failures, including fuel handling systems and turbine governor
- Drive maintenance backlogs down
- Focus on Minor Modifications improvements and fix design legacy issues

VALUE FOR MONEY

- Shift to Days Based Maintenance
- Restructure work management and improve preparations and adherence to process responsibilities
- Maintain strict controls and accountability on outage scope, schedule and cost, including continued operations
- Improve outage execution
- Improve parts availability through smart ordering and through a strategic spares initiative

Pickering - 2013-2015 Equipment Reliability Plan

Problem Statement

- Pickering must be “ready and reliable by 2015” in order to deliver needed power as Darlington undergoes refurbishment.
- Pickering Nuclear FLR performance does not meet expectations, in particular Units 1, 4, and 8.
- Work Order Backlogs (On-line Corrective and Deficient Maintenance) are highest on Units 1, 4, and 8.

Objective

- Define and execute a plan to achieve an incremental reduction of Pickering Nuclear FLR to 5.5% in 2015

Pickering Nuclear Plan for 5.5% FLR - Summary

- The plan has three main elements:
  - Human Performance Improvement
  - Targeted backlog reduction
  - Execution of Equipment Reliability Projects

- The priority for the targeted backlog reduction is with Units 1, 4, and 8.
- Projection is for the additional scoping and completion of up to 250 Work Orders per outage.
- Investment and costs included in this business plan:
  - Targeted backlog reduction - $11M ($3M for 2013, $6M for 2014, $2M for 2015)
  - P5-8 Fuel Handling Reliability project - $29M
  - Equipment Reliability initiatives -$5M

Pickering - Plan for 5.5% FLR

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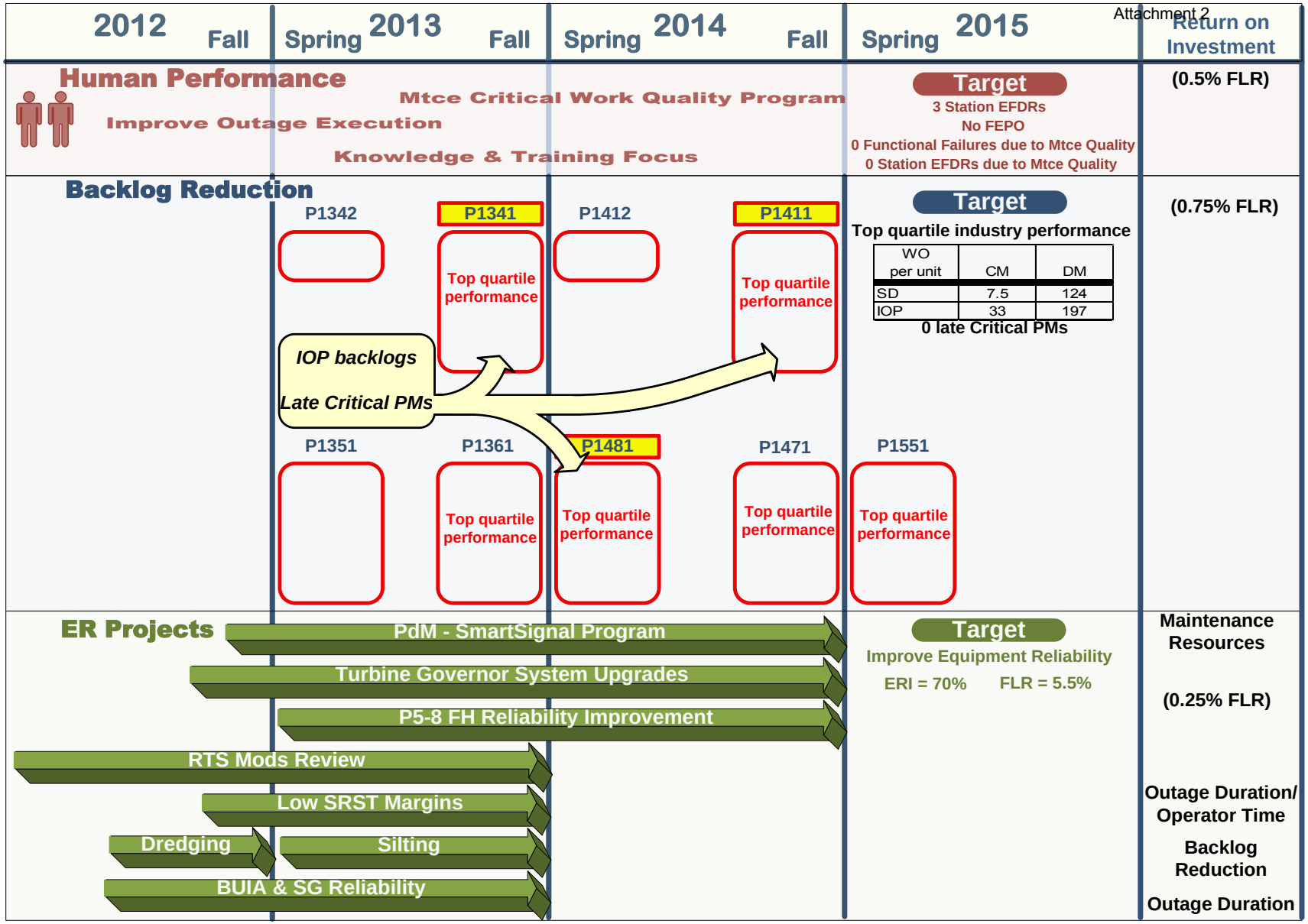

Darlington - Executive Summary

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Darlington's goal is to be the best performing nuclear plant in the world. In 2012, our Peer Review confirmed that the station is on the right path. Darlington's objective for the 2013-2015 plan is to continue its "*Journey of Excellence*" while positioning the station for refurbishment and beyond.

Two key focus areas for continuing improvement are in equipment reliability and leadership development.

- Equipment reliability will lead to improved station performance.
- Leadership development will be implemented through improved leadership behaviours.

This plan will also ensure the station is prepared for the refurbishment outage through integration and alignment.

Key Operating Assumptions

- Unit 2 refurbishment will commence in October 2016.
- Minimal derates due to Heat Transport System (HTS) aging (Neutron Over Power (NOP) analysis accepted in 2013).
- No large scale fuel channel gap inspection program.
- Advance D1711 outage work in 2014 and 2015 to minimize 2017 outage duration.
- 12 year VBO cycle.

Darlington - Major Focus Areas

Continue implementation of initiatives and improvement plans:

SAFETY

- Improve fuel reliability
- Use a graduated risk management approach
- Continue to improve work protection performance
- Reduce tritium emissions
- Implement Fukushima programs (e.g. emergency response)
- Implement Conventional Safety improvements

RELIABILITY

- Improve fuel handling material condition
- Utilize an integrated aging management approach for life cycle management
- Improve Water Treatment Plant
- Enhance chemistry performance
- Reduce online backlogs
- Decrease Zebra Mussel fouling and Microbiologically Induced Corrosion

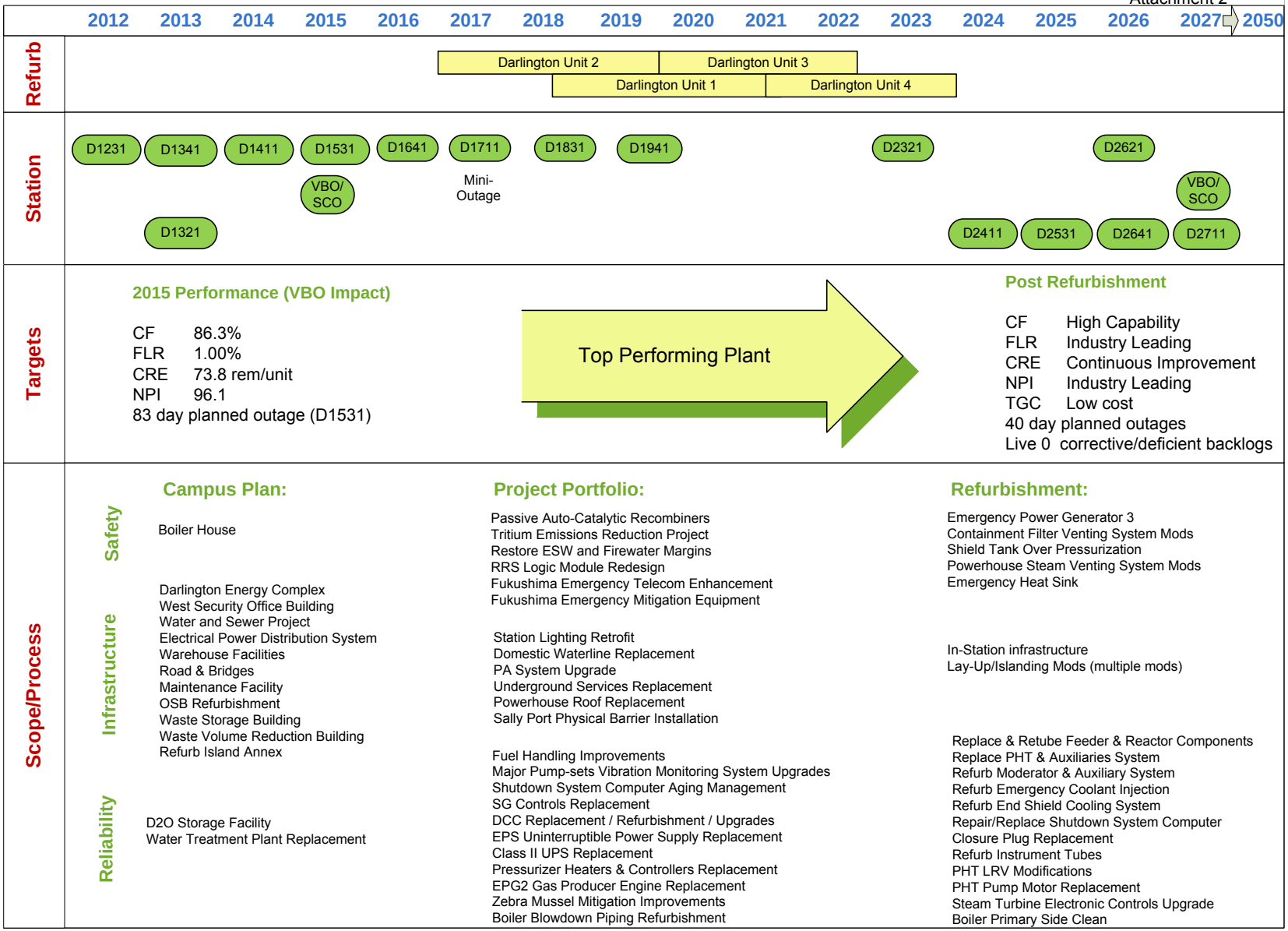
HUMAN PERFORMANCE

- Enhance leadership development
- Improve licensed operator throughput
- Utilize effective change management and communication
- Improve employee engagement
- Reinforce accountability

VALUE FOR MONEY

- Change frequency of VBO/SCO outage cycle to once every 12 years
- Align and integrate with Refurbishment Project
- Improve work order readiness
- Implement Capital Minor Modifications
- Increase productivity efficiencies

Darlington - Vision



Darlington - Maintenance Resource Headcount On the Tools

Year	Mechanical	Control	Civil	FIN	Total Headcount (Base Hours)
2008	132	167	121	0	420 (611,520)
2009	109	144	119	25	397 (578,032)
2010	103	136	110	25	374 (544,544)
2011	100	134	108	25	367 (534, 352)
2012	93	136	99	29	357 (519,792)
2013	94	121	89	32	336 (489,216)
2014	93	117	88	32	330 (480,480)
2015	93	117	88	32	330 (480,480)

- Includes staff on the tools (Maintainers and FLMa's) from maintenance sections identified (based on approved Business Plan Numbers 2008 through 2013 plans)
- With declining resources, the following strategies will be implemented to meet work load demand:
  - Pre-authorization of work
  - Days based maintenance
  - Outsourcing

Nuclear Waste Management - Executive Summary

Nuclear Waste Management Division's (NWMD) goal is to achieve the highest standards in the safe management of nuclear waste.

NWMD's scope of work is managing ongoing nuclear waste for Ontario's Nuclear Generating Stations (Pickering, Darlington and Bruce Power). This plan will focus on the following:

- Pickering: Support life extension and prepare for shut down.
- Darlington: Prepare for Refurbishment and support the Vacuum Building Outage in 2015.
- Bruce Power: Provide waste management services and continue on-site tritiated heavy water transfers between Bruce A and B.

On-site facilities at the Western Site have expanded with the in-service of Used Fuel Storage Buildings 3 & 4, and Low Level Storage Buildings 13 & 14. In-ground Containers-18's in-service in 2013 for intermediate level waste.

Key Operating Assumptions

- While reducing overall costs, maintain increased production targets of Dry Storage Containers (DSCs) at the Darlington and Pickering Waste Management Facilities with no additional staff increases.
- Darlington Retube Waste storage building in-service in 2016.
- L&ILW Deep Geologic Repository (DGR) delayed by 3 years to accommodate the Joint Review Panel process.
- One additional year of fuel storage will be required as a result of Pickering operating to 247k EFPH.
- Assess technical, financial, and operability of the Low and Intermediate Level Waste (L&ILW) incinerator and determine future operation or refurbishment.

Nuclear Waste Support to Bruce Power

Bruce Power pays OPG annually for the life-cycle management of their nuclear waste which includes processing, storage, and disposal. The revenue stream is in effect while the Bruce units are in operation. OPG's commitment to store and dispose of the Bruce used fuel and waste will continue post operations.

The majority of the revenue relates to the management of their Used Fuel, with the balance relating to the management of their Low & Intermediate Level Waste.

NWMD provides the following support to Bruce Power on an annual basis:

- Receive, process, and store 130 DSC's per year ([redacted] staff dedicated to this work).
- Receive, sort, process, and store 2,800 m^3 per year of L&ILW.
- Transportation services of radioactive material.
- Conventional landfill management services.

Nuclear Waste Management - Major Focus Areas

SAFETY

- Strive for zero High Maximum Reasonable Potential for Harm Events
- Improve Fire Protection Program and Systems
- Maintain Wildlife Habitat Council Certification

HUMAN PERFORMANCE

- Develop Systematic Approach to Training-compliant training and improve NWMD training programs and performance measures
- Enhance leadership behaviours and accountabilities

RELIABILITY

- Improve System Health Reports
- Develop Aging Management for Used Fuel and Low and Intermediate Level Waste Systems and Structures
- Implement Trench Remediation and Overpack Project
- Improve Work Management organization and process

VALUE FOR MONEY

- Execute a L&ILW processing strategy with a focus on volume reduction and reduction of the environmental footprint
- Process and store annual commitment of Dry Storage Containers
- Execute Used Fuel long term potential cost reduction initiatives
- Simplify governance

Nuclear Operations - Staff Plan

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MAJOR DIVISIONS	Year End Headcount		
Regular Staff	**2013**	**2014**	**2015**
Pickering	1,851	1,786	1,764
Pickering Workforce Development Program	8	57	66
Darlington	1,198	1,154	1,140
Darlington Workforce Development Program	35	33	33
Darlington Refurbishment Workforce Development Program	33	41	21
Nuclear Engineering	962	921	882
Engineering Workforce Development Program	8	8	8
Fleet Operations and Maintenance (excluding Workforce Development Program)	149	139	136
Maintenance Roving Outage Crew	72	72	72
Nuclear Waste Management	203	202	200
Nuclear Services (including RP Project Crew)	236	222	213
Security and Emergency Services	566	556	544
Office of Chief Nuclear Officer and Chief Nuclear Operating Officer	4	4	4
Regular Staff Total	**5,325**	**5,195**	**5,083**

Major Contributors to Staff Savings

- Management of attrition and position vacancies, and mitigating impact through Business Transformation Initiatives, Fleet and Local Improvement Initiatives, productivity improvements and appropriate prioritization of work
- Consolidation and centralization (e.g., Pickering amalgamation, Business Transformation)
- Process improvements and streamlining
- Reduced management and increased span of control through centre-led organization
- Standardization of programs, processes and equipment
- Optimization of services and utilization of contractors (e.g., EPC design vendors)
- Automation of processes and report generation

Nuclear Operations – Financial Plan

3 Year Cost Plan ($ Millions)

Cost Category / Work Program	2013	2014	2015
OM&A			
Base	1,063.3	1,079.6	1,081.3
Outage	235.5	208.6	260.1
Total OM&A	**1,298.8**	**1,288.1**	**1,341.3**
Capital			
Minor Fixed Assets	10.3	11.7	12.1
Total Capital	**10.3**	**11.7**	**12.1**
Provision Expenditures			
Decommissioning P2/P3 Long Term	8.2	8.4	8.6
Low & Intermediate Level Waste	38.1	33.5	33.5
Used Fuel Storage	69.3	69.2	68.9
Total Provision	**115.5**	**111.1**	**111.0**

Note: Overall organizational accountability for execution of OM&A and Capital Projects (including the Nuclear Portfolio) resides with the Nuclear Projects organization. To align with current Corporate Reporting, all Project costs are shown under Nuclear Projects.

Fuel Costs ($ Millions)	2013	2014	2015
Fuel			
Uranium	215.9	220.3	207.1
Combustion Turbine Unit (CTU)	4.0	4.1	4.2
Used Fuel Storage and Disposal	52.5	56.0	56.5
Total Fuel	**272.4**	**280.3**	**267.8**

Nuclear Business Plan Risks

Risk Description	Risk Treatment	Residual Risk
Failure to Retain and Replace Leadership Talent		
OPG's constrained compensation structure, and the current Business Transformation strategy to lower staff levels through attrition, will inhibit retaining and attracting necessary resources in a competitive labour market. The Province has constrained compensation for public sector executives and planning to reform public sector pension plans. The business impacts have the potential to be significant.	Mitigation plans include: Regular review of internal candidates with focus on enhanced development of future leaders; enhanced coaching and support to managers for successor candidates; Emerging Talent program to identify and fast track high performance/high potential employees with longer career horizons to become leaders of future; and identify emergency successors for leadership roles to mitigate the risk of sudden departures.	Residual risk is the same as original risk level during the implementation of mitigation plans. The risk will reduce over time as the development and leadership skill enhancement occurs.
Unexpected Fuel Channel Degradation at Darlington		
Fitness for service of pressure tubes cannot currently be demonstrated beyond 2013, due to reduced fracture toughness. Fitness for service of annulus spacers cannot be demonstrated beyond 2014.	Fuel Channel Life Management Project provided a new fracture toughness curve and timelines to modify heat-up and cool-down operations. A Long Term Spacer Management Plan (LTSMP) will be developed and executed. Regulatory concurrence will be secured on the plan and outcome.	The residual risk is the inability to depressurize to new low pressures during start-up and cool-down. The Regulator may not accept the disposition of reduced margins in a timely way. Insufficient confidence following inspections, tests and samples from the core, may lead to expansion of the inspection and spacer retrieval program or the results may show spacers are not fit for duty.
Darlington Primary Heat Transport Pump Motor Failures Impacting Station Operations		
There are indications of winding deterioration in 8 of 16 motors. One degraded spare is available; additional spares will be available in 9-12 month timeframe.	Partial discharge monitoring is being installed (50% complete). Four new spare motors are being procured (Q3 2013). Targeted motors will be replaced and condition assessments will quantify the risk.	Current risk is that a single failure results in a 35 day forced outage. Dual failure would result in a 9 to 12 month forced outage.
Parts Procurement Impacting Station Operations		
There is no proactive process for managing parts procurement. Issues include late identification of needed parts, the quality of vendor manufacturing, and strategies for stocking and re-ordering parts. OPG parts procurement is further challenged by aging plant components. Lack of a proactive obsolescence management process leads to reactionary behaviours (emergent and rush priorities).	Nuclear Supply Chain has several initiatives underway to address parts procurement and obsolescence issues.	Parts procurement and obsolescence issues impacting on lost production are expected to decline by year-end 2014. Some of the initiatives are in the early stages of implementation. As many of the underlying causes to these issues are organizational and behavioural, the implementation is considered difficult to manage.
New Regulation to Lower Tritium Limit in Drinking and Ground Water		
Ontario Drinking Water Advisory Committee recommended to the Ontario Ministry of Environment (OMOE) a Drinking Water Standard of 20 Bq/L of tritium as an annual average, which is a fraction of current Ontario and Federal standards.	A strategy will be developed for implementation should the government propose to change the Drinking Water standard and/or Ground Water limit.	There is a residual risk that the tritium limit in drinking water may be decreased, causing OPG to be in non-compliance when there is a transient in tritium concentration.

Nuclear Business Plan Risks (Continued)

Risk Description	Risk Treatment	Residual Risk
Pickering Fuel Handling Failures Impact Station Operations		
Fuel Handling systems are at the end of 30 year design life, and reliability is poor.	Component obsolescence and end of life challenges will be addressed through component replacements. AP-913 will be implemented to identify issues and develop project scope. Fuel Handling FLR will be monitored through the Plant Health process.	Not all Single Point Vulnerable components will be replaced.
Vendor Quality Issues Impacting Equipment Reliability		
Nuclear generation lost due to vendor quality issues amounted to $74.5 million in 2010 (or 1.4 TWh) and $5.2 million in 2011 (or 0.1 TWh). As of July 2012, nuclear generation lost, due to vendor quality issues, was $20 million (or 0.3 TWh).	In 2011, OPG implemented a new management system for managing and monitoring supplier's quality performance including a process on tracking, controlling and dispositioning counterfeit, fraudulent, and/or sub-standard items (CFSI). In 2012, continued to refine the management system implemented in 2011. Supplier performance monitored using KPIs and metrics for generation loss, threats, and rework. Completed a self assessment on 'near miss' or lower tier quality incidents that could have negatively impacted on generation. Corrective action plan is in progress.	Target is 0.3 TWh by 2015. Continued vendor quality/CFSI issues causing lost generation.
Loss of Atomic Energy of Canada Limited (AECL) Capability and Knowledge		
Nuclear relies on AECL to support many maintenance and project activities. Due to the Government of Canada's annouced restructuring of AECL, there continues to be substantial uncertainty around the future capabilities of AECL.	OPG reviewed its AECL contracts and is negotiating with AECL for a long term service agreement for intellectual property (IP) owned by AECL. OPG is also negotiating with AECL for a separate IP agreement which clarifies OPG's rights to use the IP where past contracts were silent or unclear. Where OPG has clear IP rights, OPG is exploring Engineering, Procurement, Construct contracts with other vendors.	Residual risk relates to those specialized services and tooling which AECL has uncontested, or potentially contested, IP rights and/or existing capabilities such that an option of selecting an alternative vendor is not possible for OPG now, nor would OPG be able to quickly contract with an alternative vendor following demise of AECL. A subcomponent of residual risk is that some IP rights reside within AECL repository, so that future access could also be restricted.
Darlington Emergency Power Generator Failures (EPG) Impacting Station Operations		
EPG2 high bearing vibrations and nozzle cracks reduce service life and carry risk of failure.	Project will optimize strategy for installation of 3rd EPG and refurbishment of EPG2. Minimize thermo shock during testing and monitoring.	Failure of EPG2 followed by functional failure of EPG1 results in station outage and high cost to repair EPG2.
Surplus Nuclear Inventory Value Exceeds Provision at Pickering End of Life		
The value of surplus nuclear inventory on hand at the time Pickering reaches end of life (EOL) exceeds the set aside provision. An inadequate inventory obsolescence provision may eventually result in extraordinary charges to OPG's reported income.	A cross functional team with Supply Chain, Nuclear Operations and Finance staff has been developing a Project Charter and detailed action plans, including a third party wall to wall physical count in 2013, of Nuclear inventory, to validate the accuracy of inventory.	There may be surplus inventory on hand at the time of Pickering's end of life that exceeds the end of life provision. The financial impact could be between $50 and S100 million. This residual risk is to be re-assessed after risk treatment actions are completed.

Nuclear Projects - Executive Summary

Nuclear Projects will continue to manage and execute high value projects, in alignment with Nuclear Operations, while satisfying the need for increased decommissioning expertise and leveraging a range of industry best practices, operating experience and lessons learned to achieve project management excellence.

Nuclear Projects is also responsible for planning and obtaining the necessary approvals for additional nuclear generation capacity. 2013-2015 Business Plan highlights include:

- Completing the Detailed Planning of the Definition Phase of Darlington Refurbishment with a focus on maintaining availability of skilled technical, trades, and project management workers to successfully deliver projects with quality, on time and on budget.
- Continuing to support the Government decision process and execute a strategy that facilitates New Nuclear at Darlington, as an integral part of Ontario's future energy mix and in accordance with the Long-Term Energy Plan released by the Ministry of Energy.
- Implementing effective Labour Relations strategies while leveraging the Extended Service Master Services Agreement (MSA) to enable Projects and Modifications to effectively execute the increased project work program with a reduced staff level.
- Providing the nuclear generating stations with quality specialized inspection and maintenance services that are delivered in an effective manner and improve the efficiency of processes.
- Continuing to be accountable for planning and preparing for decommissioning requirements, including program and engineering oversight and design authority functions for OPG's Low and Intermediate Level Waste Deep Geological Repository and oversight of Nuclear Waste Management Organization's Adaptive Phased Management program for used fuel.

The 2013-2015 OPG Nuclear Projects Business Plan incorporates key elements of the Corporate Business Transformation initiative and commits to delivering projects on time and on budget to the highest quality standards while ensuring the safety of all personnel involved.

Nuclear Projects - Planning Assumptions

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Ex. F2-1-1
Attachment 2

Nuclear Refurbishment

- First unit refurbishment (Unit 2) – October 2016.
- Refurbishment duration – all 4 units – 88 months.
- Plan includes funding for Facilities and Infrastructure projects required to support refurbishment and ongoing station operations.

Darlington New Nuclear Project

- OM&A program addresses the continuation of the planning and preparation activities including:
  - The Service Agreement process to be completed by 2013 year-end.
  - Compliance with the License to Prepare Site.
  - Progressing the long lead environmental follow-up program items.

Projects & Modifications

- The Projects and Modifications work program will focus on Operational Project Portfolio execution, and Nuclear Waste and Darlington Refurbishment project work.
- Conduct of Maintenance initiative will reduce Contractor Management Office and field engineering staffing requirements in future outages.

Inspection and Maintenance Services

- Work scope is aligned with the Fuel Channel Life Management Project and station generation plans.
- The IMS work program does not support Nuclear Refurbishment other than pre-refurbishment inspections.

Nuclear Decommissioning Organization

- CNSC decommissioning requirements will not substantially change over the business planning period.
- Pickering shut down and safe storage plans will not be modified significantly from the current reference plan.
- The schedule for the Low and Intermediate Level Waste Deep Geological Repository (DGR) has been adjusted to accommodate an extended Joint Review Panel process.
- The schedule for NWMO's Used Fuel Repository assumes an in-service date of 2035.

Nuclear Projects - Issues and Focus Areas

Projects and Modifications

- Focus on reducing regular staff headcount while undertaking an increased project work program and maintaining safety, quality, cost and schedule.
- Implement an effective Labour Relations strategy and leveraging the Extended Services Master Service Agreement critical to ensure the success of executing the project work program with reduced staff levels.

Inspection & Maintenance Services

- Provide the nuclear generating stations with quality specialized inspection and maintenance services that are delivered in an effective manner.
- Improve the efficiency of processes, ensure the reliability of equipment and executing the program with skilled staff.

NDO / NWMO Oversight

- Decommissioning: Continue to work on the Preliminary Decommissioning Plans and associated cost estimates; plan for decommissioning of the Pickering site; improve the decommissioning planning process; and remain involved in rulemaking and regulations.
- Oversee the Regulatory Approval Phase of OPG's Low and Intermediate Level Waste Deep Geological Repository until it receives the license for the Site Preparation and Construction.
- Provide oversight of OPG's Adaptive Phased Management to ensure value for money and optimization of the long term management of used fuel.

Nuclear Refurbishment

- Develop effective and efficient project management, including: oversight of contractors, in an EPC contracting environment; contract management and monitoring capability and processes.
- Finalize scope and develop the Release Quality Estimate.
- Complete Refurbishment pre-requisites such as: design, fabrication and testing of Retube and Feeder Replacement tooling; and completion of Facilities and Infrastructure projects.
- Obtain regulatory approvals of Environmental Assessment, Integrated Safety Review and Integrated Improvement Plan.

Nuclear New Build

- Support the Government process for evaluation of the cost and schedule for two potential nuclear reactors at Darlington.
- Continue to execute a strategy that supports New Build as an integral part of Ontario's future energy mix.
- Advancing key regulatory compliance and commitment activities that affect the scope and schedule for New Build.
- Maintaining an organization dedicated to planning and preparation activities.

Alignment of Project Portfolio to Objectives and Risk Mitigation

SAFETY

- Continue completion of CNSC Fukushima action items by Q4 2013, e.g.:
  - Demonstrating Severe Accident Management Guidelines (SAMG) effectiveness using table-top exercises and drills, and assessing survivability of equipment essential to SAMG execution
  - Evaluating potential for hydrogen generation and need for hydrogen mitigation in the Irradiated Fuel Bay areas
- Complete Probabilistic Risk Assessment Upgrade Project over 2013-2014
- Comply with Regulatory requirements and commitments (e.g., Environmental Qualification, Fire Protection, Security, Fire Safety Assessment Upgrade, Pickering Fish Barrier)
- Strong Nuclear Safety Culture; Zero Lost Time Accidents

HUMAN PERFORMANCE

- Simplify project management governance through a high level framework
- Simplify business processes and procurement (e.g., matrix Supply Chain staff and ES MSA contract)
- Enhance project management oversight by ensuring alignment with strategic direction and improving quality and delivery standards
- Improve project management competency by implementing focused workshops and hiring experienced project managers
- Develop emerging project leaders and target training in Nuclear Engineering on high need areas (e.g., Design Engineering)

RELIABILITY

- Support the Pickering Equipment Reliability Plan (e.g., through major projects such as P1-4 Turbine Governor Upgrade and P5-8 Fuel Handling Reliability Project)
- Undertake specific Reliability Projects (e.g., replacement of Darlington Digital Control Computers and Darlington Shutdown System Monitor Components)
- Meet station demand for increased minor modifications budgets
- Integrate Life Cycle Management Plans and Component Condition Assessments into portfolio development and prioritization
- Ensure committed Waste Provision Projects remain on schedule and budget (e.g., waste facility upgrades and modifications)

VALUE FOR MONEY

- Complete the Fuel Channel Life Management Project (e.g., Probabilistic Leak Before Break methodology, Transition Region regulatory issue, Darlington 10-year Spacer Plan)
- Extended Services MSA agreement – leverage EPC strategy, with more accountability on vendors
- Business Transformation Initiatives in Nuclear Engineering impacting projects
- Strategic sourcing for Technical Contractors

Nuclear Refurbishment - Executive Summary

Darlington Refurbishment is completing the Detailed Planning of the Definition Phase.

- Plan will be updated consistent with the planned release of funds and reflects improved cost estimates.
- Overall project cost remains within previous estimate; major change is related to annual cash flows.
- Key deliverables in the business planning period include:
  - Post submission activities related to the Environmental Assessment (EA) and Integrated Safety Review (ISR)
  - Submission of the Integrated Improvement Plan (IIP)
  - Completion of refurbishment pre-requisite work
  - Negotiation and award of remaining major contracts, e.g. Turbine Generator, Fuel Handling, and Steam Generator Primary Side Clean
  - Preparation for refurbishment execution including completion of scoping, engineering, planning, and Release Quality Estimate (RQE) by October 2015
  - Completion of the construction of facilities and infrastructure required to support Darlington Refurbishment Project
  - Completion of Retube and Feeder Replacement (R&FR) tooling and mockup

Nuclear Refurbishment - Major Focus Areas

- Developing effective and efficient project management, including oversight of contractors, in an EPC contracting environment.
- Developing contract management and monitoring capability and processes.
- Scope finalization and development of Release Quality Estimate:
  - Implementation of contracting strategies
  - Finalization of cost estimates and schedules
  - Completion of all engineering deliverables
- Design, fabrication, and testing of R&FR tooling to determine project durations for re-tube and feeder replacement activities.
- Completion of Facilities & Infrastructure projects needed for Darlington Refurbishment.
- Completion of refurbishment pre-requisite work including work tied to approved scope, as well as Station Improvement Opportunity projects and minimize interferences with VBO.
- Obtaining regulatory approvals of Environmental Assessment, Integrated Safety Review and Integrated Improvement Plan.
- Continue discussions with Power Workers Union and Building Trades Union.

Nuclear New Build - Executive Summary

- Long-Term Energy Plan released by the Ministry of Energy commits to the procurement of additional units at Darlington.
- All decisions to move forward with the two potential nuclear reactors will be made by the Government of Ontario.
- OPG continues to support the Government decision process.
- Service Agreements were signed with each of Westinghouse and SNC-Lavalin/Candu Energy to prepare detailed construction plans, schedules and cost estimates.
- Continue to execute a strategy that supports New Nuclear at Darlington as an integral part of Ontario's future energy mix.
- Project OM&A reflects the resources for successful compliance with the License to Prepare Site (LTPS) requirements, as well as supporting the Government decision process.

Key Operating Assumptions

- OM&A program for continuation of the planning and preparation activities assumes:
  - Analysis of the Service Agreement deliverables as provided by Westinghouse and SNC Lavalin/Candu Energy prior will be completed by 2013 year end.
  - On-going compliance and monitoring of the Environmental Assessment and License to Prepare site commitments.
  - The Government decision to proceed with new nuclear is expected in early 2014.
  - Progressing the long lead environmental activities will ensure the Project can proceed without delays.

Nuclear Projects - Staff Plan

MAJOR DIVISIONS	Year End Headcount		
Regular Staff	**2013**	**2014**	**2015**
Projects & Modifications	330	326	322
Inspection & Maintenance Services	373	363	363
Nuclear Decommissioning	7	7	7
NWMO Oversight	1	3	4
EVP-Nuclear Projects	2	2	2
Subtotal - Operations Support	**713**	**701**	**698**
Nuclear Refurbishment	247	266	276
Nuclear New Build	23 *	21 *	21 *
Regular Staff Total	**983**	**988**	**995**

Major Contributors to Staff Savings

- IMS savings from consolidation of positions and programming changes (e.g. optimize outage coordination).
- Projects & Modifications savings from: extended services from Master Services Agreement strategy; Purchased Services Agreement overflow - maintenance quality model; and simplification of governance and processes and right-sizing training.
- Major Project staff numbers are indicative and evolving, subject to change from more detailed planning. Refurbishment reflects timing adjustments. New Build currently reflects the Base Case of not proceeding.

* Note: For resource planning purposes, Nuclear New Build staff levels are shown for planning and preparation for development of project. Staff levels will be reassessed if the project is approved.

Nuclear Projects - OM&A Cost Plan

3 Year Cost Plan ($ Millions)

Cost Category / Work Program	2013	2014	2015
Base and Outage			
Base	51.0	49.7	52.4
Outage	100.3	75.5	90.5
Total Base and Outage OM&A	**151.3**	**125.1**	**142.8**
Project			
Nuclear Project Portfolio	84.3	101.1	105.8
Fuel Channel Life Management	14.7	6.8	0.6
Pickering Continued Operations	6.0	6.0	0.0
Operations Support Projects	**104.9**	**113.9**	**106.4**
Darlington Refurbishment	18.2	19.6	18.2
Nuclear New Build	38.6 *	10.3 *	9.5 *
Major Projects	**56.7**	**30.0**	**27.7**
Total Project OM&A	**161.6**	**143.8**	**134.1**
Total OM&A	**312.9**	**268.9**	**277.0**

* Note: Nuclear New Build costs are for planning and preparation activities and will be reassessed if the project is approved.

Nuclear Projects - Capital and Provision Plans

3 Year Cost Plan ($ Millions)

Cost Category / Work Program	2013	2014	2015
Capital			
Projects - Nuclear Portfolio (including Capital Spares)	150.3	175.0	122.2
Minor Fixed Assets	9.6	9.6	9.6
Operations Support Capital	**160.0**	**184.6**	**131.8**
Nuclear Refurbishment	529.8	837.4	631.8
Nuclear New Build *	-	-	-
Total Capital	**689.8**	**1,022.0**	**763.6**
Provision Expenditures			
Decommissioning - Preparation for Safe Storage P6 Units	1.8	1.6	3.0
IMS - Used Fuel Storage	0.6	0.6	0.6
Provision Projects	40.1	40.1	40.0
Nuclear Decommissioning	1.1	1.0	1.1
NWMO DGR (Deep Geologic Repository)	19.5	19.9	74.6
NWMO APM (Adaptive Phased Management)	52.0	70.2	106.4
NWMO L&ILW DGR Oversight & APM	6.5	10.2	10.4
Subtotal - Provision-NDO/NWMO	**79.0**	**101.2**	**192.5**
NWMO - Refurbishment Retube Waste Containers	1.6	17.6	17.5
Total Provision	**123.2**	**161.1**	**253.6**

* Note: Capital costs for Nuclear New Build will be defined upon project approval.

2013-2015 OM&A Project Portfolio

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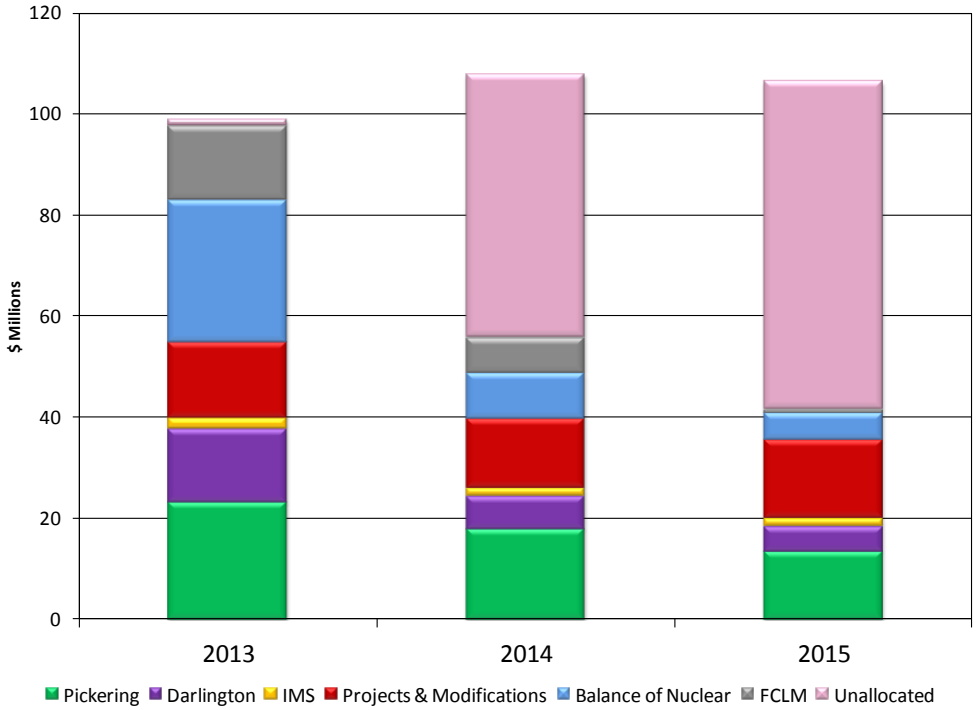
Ex. F2-1-1
Attachment 2



- The OM&A Portfolio takes into account:
  - Spending on minor modifications to ensure safe and reliable operation to scheduled end-of-life at Pickering
  - Ongoing Fukushima related projects for program management and procedure development
  - End of the Fuel Channel Life Management project

2013-2015 Capital Project Portfolio

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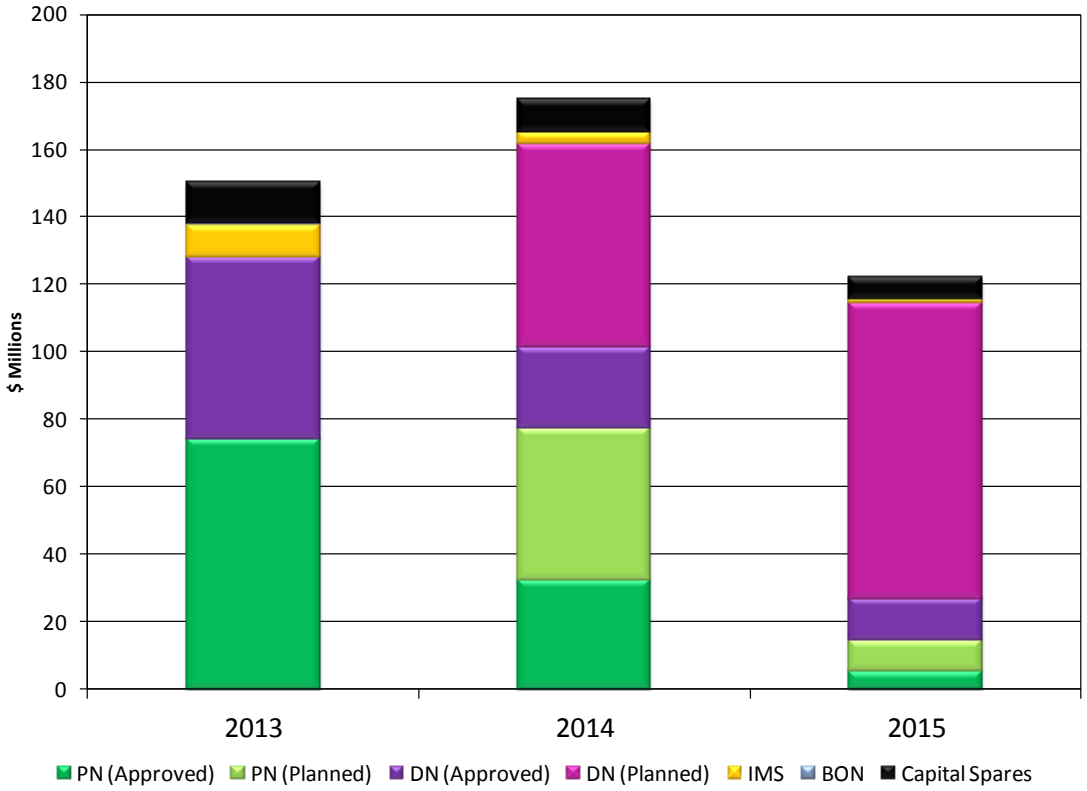
Attachment 2



- The Capital Portfolio takes into account:
  - Increased investment in Darlington to sustain safe and reliable operation
  - Appropriate investment in Pickering to maintain safe and reliable operation as it approaches its scheduled end-of-life
  - Investment in Fukushima related projects
  - Acquisition of capital spares to replace life expired components

Appendix A

Nuclear Support Program Details

Nuclear Support

Nuclear Engineering

- Centre-led, Nuclear Engineering management structure and accountability.
- Business Transformation initiatives to enable improvements.
- Initiative to improve Design Quality.
- Engineering Knowledge Retention and 'Emerging Leaders' Program.
- Delivered on Fuel Channel Life Management (FCLM), Probabilistic Risk Assessment, Power Operated Valves and Pickering Fish Net Projects.
- Darlington Refurbishment Support (specialized engineering).
- Ongoing Fukushima Response: Implementation.
- Pickering 3K3 reliability initiative on track.
- Engineer/Procure/Construct (EPC) model moving into execution phase.

Fukushima Response

- Completed 48 of 101 Fukushima Action Items (FAIs) and working toward completion of 27 more by year end. (Note that CNSC closure of actions is still pending on the majority of completed FAIs.) (2012)
- Implemented Emergency Mitigation Equipment (Phase I) to provide cooling and monitoring capability in the event of an extended loss of AC power. (2012)
- Continuing analysis under Probabilistic Risk Assessment Project (PRA) and Severe Accident Management Guidelines (SAMG) Project, such as Multi Unit events and structural integrity of IFBs. (2012)
- Installation of Passive Autocatalytic Recombiners (PARs) on D3 (complete) and P1 & P7 (planned). (2012)
- SAMG effectiveness demonstrated using table top exercises and drills. Assessment of the survivability of equipment and instruments essential in SAMGs (FAI 1.8). (2013)
- New start: option evaluation for Pickering Beyond Design Basis (BDB) Containment Venting Improvements. (2013)
- Progression of next phases of improvements for SAMG and EME. (2013)
- Continued PARs installation on remaining units . (2013-2014)
- Industry agreement and determination of Regional Emergency Response Centre. (2013)

Nuclear Support (Continued)

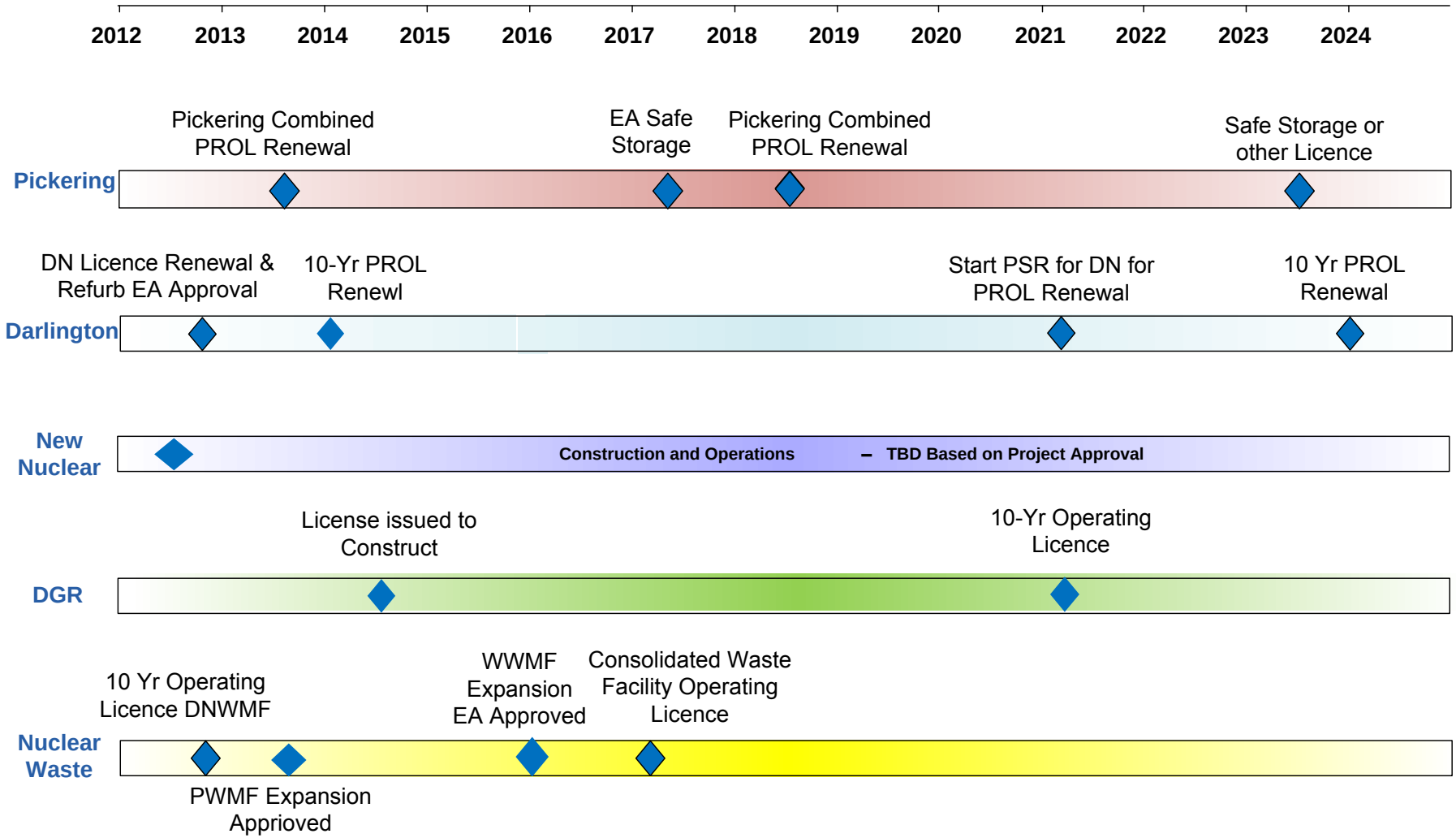
Nuclear Services

Nuclear Services' vision is to be a reliable and responsive resource and deliver value to Nuclear Operations and Projects by:

- Providing effective and efficient Radiation Protection Services, Regulatory Affairs, Strategic Planning and Benchmarking, Environmental Assessments and Stakeholder Relations centre led functions to Nuclear Operations and Nuclear Projects.
- Focusing attention on and driving fleet wide initiatives for continuous improvement as identified through: operational benchmarking; highlighting our performance to industry performance, standards and expectations to identify gaps for improvement.
- Setting high quality achievable performance standards and monitoring business performance against these standards.
- Maintaining regulatory relationships and influencing regulatory agencies to facilitate the needs of the Nuclear businesses, and obtaining all CNSC regulatory approvals.
- Safely delivering Radiation Protection services to Nuclear Operations.
- On behalf of the CNO and EVP-Nuclear Projects, support development of strategic plans for the Nuclear business.

Nuclear Operations Support

OPG Major Licensing Activities



Nuclear Support (Continued)

Operations and Maintenance Support

Enabling Improved Fleet Performance through:

- Leadership
- Direction Setting and Performance Monitoring – Corporate Functional Area Managers
- Process Improvement
- Collaboration
- Partnership

Key Focus Areas:

- Improved Work Protection: Model permits in use at sites for targeted systems; Integrate work protection into technical procedures to simplify processes; Quality focus on PC1 application and prepare and check of permits; and Implementation of standard permits.
- Operations Excellence: Supervisory selection and development; Coordinating enhancements to technical and behavioural training across sites; and Operations-led reduction in operations challenges and backlog, and improved plant reliability.
- Reducing Corrective Maintenance Backlog: Develop, implement and monitor Maintenance backlog reduction plans at the sites (2013 - NFI - 04).
- CAP improvement: Continued execution and monitoring of plan at sites focusing on improved behaviours and results.
- Business Transformation transition: Executing the plan.
- Governance Simplification and Reduction: Review freeze and process simplification.

Nuclear Support (Continued)

Security and Emergency Services

- Based on May 3, 2012 Business Transformation, transitioning 9 departments into a centre led Enterprise for Security and Emergency Services OPG-wide.
  - **SES Programs** – Enterprise focus on Governance, Investigations, Intelligence, Risk, and Clearance
  - **Pickering Security** – Site security services including access, detection and protection systems, defensive strategies
  - **Darlington Security** – Same as above with a focus on additional Refurb activities
  - **Emergency Management (EM) and Fire Protection** – Enterprise EM Strategy, Nuclear Emergency Preparedness, Fire Protection Program, Training, and Emergency Response Team
  - **Specialized Training** – Security training to meet all Regulatory requirements including armed qualifications
- Capitalize on synergies and realize cost savings with efficient and effective centre led functions.
- Human Performance Improvement; integrated drills (EM / Security / Fire), leadership courage, field presence.
- Commitment of continued high standard of operational support to stations in all disciplines.
- Continued focus on value for money through: adaptive resourcing; and overtime reduction in fire and security.

Nuclear Support (Continued)

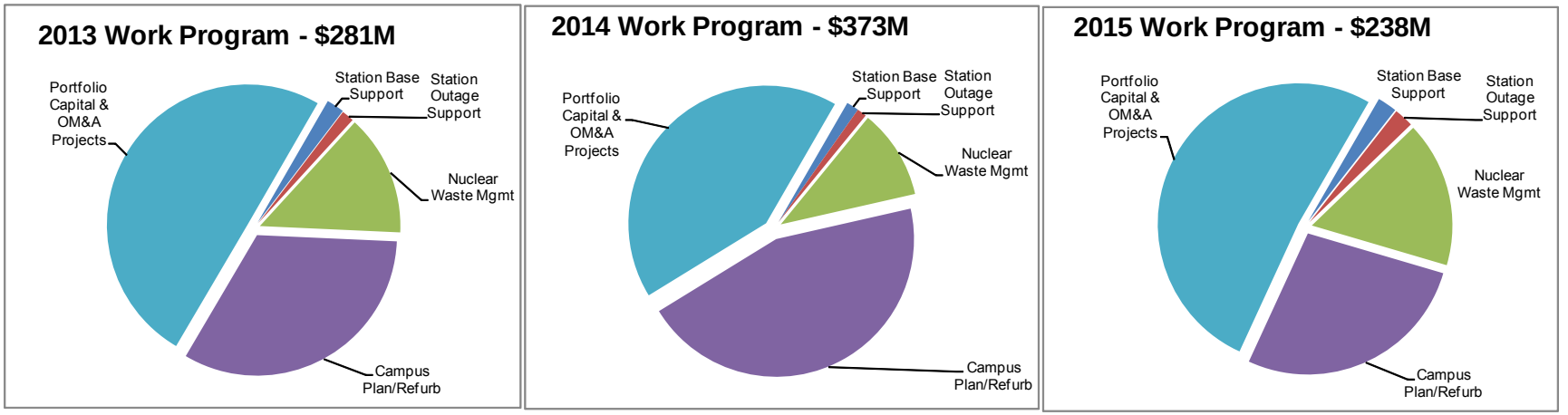
Projects & Modifications

Projects & Modifications will focus on reducing regular staff headcount while undertaking an increased project work program and maintaining safety, quality, cost and schedule.

Implementation of an effective Labour Relations strategy and leveraging the Extended Services Master Service Agreement is critical to ensure the success of executing the project work program with reduced staff levels.

From the 2012 value of $263M, the project work program is expected to grow in 2013 and 2014 with the following cost mix.

Projected Work Program



Nuclear Support (Continued)

Inspection & Maintenance Services

Inspection & Maintenance Services will provide the nuclear generating stations with quality specialized inspection and maintenance services that are delivered in an effective manner.

The 2013-2015 business plan is focused on improving the efficiency of processes, ensuring the reliability of equipment and executing the program with skilled staff.

These objectives will be achieved by:

- Implementing strategies to improve critical path performance
- Benchmarking vendors to look for improvement opportunities
- Improving equipment reliability through tooling upgrades and improved maintenance practices
- Completing major projects and developing new tooling solutions on time (e.g., Universal Delivery Machine delivered GAP)
- Effectively implementing the Human Performance plan
- Developing a long term Strategic Plan – charting the future of IMS over the next 10 years

Nuclear Support (Continued)

Nuclear Decommissioning & NWMO Oversight

- The Nuclear Decommissioning Organization (NDO) is responsible for planning and preparing for decommissioning of all OPG owned Nuclear facilities.
- Consistent with this long term program, NDO also provides:
  - Program and Engineering oversight and Design Authority functions for OPG's Low and Intermediate Level Waste Deep Geologic Repository (L&ILW DGR).
  - Oversight of NWMO's Adaptive Phased Management (APM) Program for Used Fuel.

Major Focus Areas

- **Decommissioning**
  - Continue to improve the Preliminary Decommissioning Plans (PDPs) and associated cost estimates.
  - Continue to plan for decommissioning of the Pickering site.
  - Continue to improve decommissioning planning process.
  - Continue involvement in rulemaking and regulations.
- **OPG's L&ILW DGR**
  - Continue to oversee the Regulatory Approval (RA) Phase until OPG receives the license for Site Preparation and Construction.
  - Continue oversight of the EPCM contract for Design and Construction .
- **NWMO's APM**
  - Continue OPG's oversight of APM to ensure value for money and optimization of the long term management of used fuel.

Appendix B

Darlington - Refurbishment Integration

Refurbishment Integration

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Ex. F2-1-1
Attachment 2

Processes in Place

- Darlington Work Management embedded in Refurb organization
- Darlington Integration Manager in role – Campus plan, Refurb pre-requisites
- Refurb work scope integration presented monthly at Value for Money Journey of Excellence and Senior Work Management meetings
- Refurbishment organization working to MA-13 and MA-22 process and milestones. Includes flags identifying mandatory outage scope
- Memo of Understanding and Service Level Agreements in development
- Integrated Work Flow Analysis document completed
- Campus Plan updates monthly at Site Management Board
- Darlington members of the following Nuclear Refurbishment forums:
  - Bi-monthly NEC meetings
  - Refurbishment Project Meeting
  - Technical Screening Committee
  - Funding Committee
  - Scope Review Board
    - Items proposed for descoping must go through station Long Range Plans

Refurbishment/Campus Plan/Project Work

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Ex. F2-1-1
Attachment 2

		Work Orders						M$ (estimated)				
	Refurburbishment Pre-Requisites	**2012**	**2013**	**2014**	**2015**	**2016**	**Unscheduled**	**2012**	**2013**	**2014**	**2015**	**2016**
Work	On-line Work Orders	23	13	11	0	0	280	0.5	0.3	3.0	2.0	0.8
	Outage Work Orders	12	152	25	9	6	25	0.2	3.0	0.7	0.4	0.1
	Dry Storage Containers	60	60	60	60	60		7.2	7.3	7.4	7.7	7.8
Projects / Campus Plan	Water Treatment Plant							4.5	17.9	26.6	2.6	
	Electrical Power Distribution System							2.0	5.3	5.5	3.3	1.2
	Water/Sewer Replacement							11.0	15.1	7.5	0.6	
	Maintenance Building							15.7	11.8	2.0		
	Darlington Energy Complex							58.1	20.4	0.7		
	PHT Pump Motor Replacement									8.0	8.0	8.0
	Station Lighting								1.5	2.0	2.0	2.0
	ZM Mitigation Improvements								0.1	0.5	2.0	2.0
	OSB Refurbishment							0.7	6.8	28.4	2.2	0.4
	D2O Storage Facility							9.1	40.4	40.9	14.7	
	West Security Office Building							2.1	7.0	45.0	6.0	3.0
	Boiler House							2.4	14.8	23.8	3.0	0.2
	Powerhouse Roof Replacement								2.7	2.7	2.7	2.7
	Pressurizer Heaters/Controllers Replacement							1.5	3.2	1.6	1.6	1.0
	Passive Auto-Catalytic Recombiners							0.6	2.1	0.8	0.2	
	IFB Hx Replacement								3.5	1.5	0.3	
	FH Improvements (multiple projects)							4.4	8.9	10.0	10.0	10.0
	ALW Refurbishment								0.3	0.4	0.4	0.1
	In-Station infrastructure								3.0	6.0	6.0	3.0
	Emergency Heat Sink								2.0	7.0	7.0	4.0
	Shield Tank Over Pressurization							0.1	1.5	2.4	3.5	2.5
	ESW Header Connection								0.4	0.7	1.0	0.7
	Moderator Connection								0.3	0.5	0.8	0.6
	EPG3							0.5	7.5	12.0	17.5	12.5
	Refurb Island Annex							0.8	2.0	17.0	6.0	1.3
	Fukushima - Emergency Storage Building							0.2	0.5	0.1		
	Containment Filter Venting System Mods								6.0	7.5	9.0	
	Lay-Up/Islanding Mods (multiple mods)								3.4	5.7	5.7	13.7
	Powerhouse Steam Venting System Mods								2.0	4.0	3.5	0.5
	Waste Volume Reduction Building								12.5	17.5	17.5	2.5
	Waste Storage Building								0.7	3.6	6.6	3.6
								121.6	**214.2**	**303.0**	**153.6**	**84.2**

Refurbishment Work Integration Process

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Attachment 2

Core Scope	Campus Plan	CCA	Regulatory Commitment	Safety/Margin	Cyclical outage	Strategic Improvement	Projects
•Fuel Channel •Feeder •Reactor Component •Steam Generator	•Master Campus Plan	•Balance of Plant •Fuel Handling •Electronic Obsolescence •Critical Spares •PMO	•Environmental Assessment Gaps •Integrated Safety Review Gaps •Others	•SIO •Margin Management •SPV	•Long Range Plan •PM •CM/EM backlog	•Outage Improvement •Safety & Margin Opportunities •FH Improvement •Operation Improvement •Economic Improvement	•Portfolio Project •Minor Mod •Project Candidate
DSR	DSR	CCA	Manual Tables	SIO	Manual Tables	Manual Tables	Prosight/Other